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10/591,089	05/21/2007	Johannes Reinschke	2005P00319WOUS	7808

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EXAMINER	
ANDREWS, MICHAEL	
ART UNIT	**PAPER NUMBER**
2834	

NOTIFICATION DATE	DELIVERY MODE
06/15/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/591,089	REINSCHKE ET AL.	
	Examiner	Art Unit	
	MICHAEL ANDREWS	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9-11 and 13-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9-11 and 13-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is responsive to the Applicant's communication filed April 27, 2011. In virtue of this communication and the amendment concurrently filed, claims 7, 9-11, and 13-26 are now pending in the application.

Response to Arguments

1. Applicant's arguments filed April 18, 2011 have been fully considered but they are not persuasive.

The Applicant’s first argument (page 7, lines 12-17of the Remarks) alleges that neither Zabar (US 6,323,568 B1) nor Rumswinkel (DE 1146578) discloses an armature part that oscillates symmetrically about a center position, or a spring that is pre-tensioned when the armature part is located in the center position. No evidence is presented in support of this statement. Zabar discloses a magnetic armature part [30-34] which is set in linear motion to symmetrically oscillate about a center position in an axial direction by the magnetic field of the winding (figures 1-3; col. 3, lines 36-40 and 50-59). Rumswinkel discloses a spring [4] that, when the armature part [2] is at the center position, the spring is pre-tensioned (figures 2-3 show the axially displaced armature in its equilibrium position; at the center position, which is shifted to the left from what is shown in the figures, the springs [4] are inherently pre-tensioned as they are no longer at equilibrium).

The Applicant’s second argument (page 7, line 18 to page 9, line 9 of the Remarks) alleges that the Examiner’s interpretation of Rumswinkel is incorrect.

However, the argument misconstrues several points and misinterprets the wording of the rejection. For example, the argument states (page 7, lines 18-19) that the "Office Action acknowledges that Zabar does not teach or suggest displacement of the armature when the armature is in the center position." This is neither what is stated nor what is claimed, as the claim language specifically defines the center position as the point where the armature and yoke are aligned, not displaced from one another.

Further, the argument states (page 7, lines 24-25) that the "new interpretation appears to assert that the center position is the position of the armature shown in Figs. 1-3." This is the exact opposite of what is explicitly stated in the grounds of rejection. The rejection stated that figure 3 of Rumswinkel "shows the axially displaced armature in its equilibrium position; at the center position, shifted to the [left], the springs are inherently pre-tensioned as they are no longer at equilibrium." The remainder of the argument continues to consider the position shown in the figures of Rumswinkel as the center position, contrary to the definition of "center position" used both in the application and the rejections.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 7, 9-10, 13-17, 19-23, and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zabar (US 6,323,568 B1) in view of Rumswinkel (DE 1146578).

With regard to claim 7, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear motion to symmetrically oscillate about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40 and 50-59), the center position being the position the armature part [30-34] adopts when oscillating between its maximum lateral deflection positions (figure 3; the armature is shown with the springs un-deflected), wherein a center of the

armature [30-34] is aligned with a center of the yoke body [10, 20] in the center position (figure 3); and

a spring [40-45] having a fixed end [42, 43] clamped in a fixed manner in a clamped position with respect to the yoke body [10 ,20] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in the direction of motion (col. 4, lines 30-36);

wherein the spring [40-45] is configured as a leaf spring tensioned transverse to the direction of movement of the armature part (figures 3 and 5; col. 4, lines 21-29).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to the clamped position, or that when the armature part is at the center position the spring is pre-tensioned.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, in the center position of the armature part [2, 3], the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to the clamped position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]), and

wherein the spring [4] is configured as a leaf spring and, when the armature part is at the center position, the spring [4] is pre-tensioned to apply a force in the direction of movement of the armature part [2, 3] (figures 2-3 show the axially displaced armature in its equilibrium position; at the center position, which is shifted to the left from what is shown in the figures, the springs are inherently pre-tensioned as they are no longer at equilibrium).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

With regard to claim 9, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 7, as stated above, further comprising a plurality of springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67 of Zabar; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 10, the combination of Zabar discloses the drive unit according to claim 7, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial

displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position (figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part away from the compressor as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 13, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear oscillating motion about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40), the center position being the position the armature part [30-34] adopts when aligned with the center of the yoke body [10, 20] in which the armature [30-34] may symmetrically oscillate relative to the yoke body [10, 20] between its maximum lateral deflection positions (figure 3; col. 3, lines 36-40 and 50-59; the armature is shown with the springs un-deflected), wherein a center of the armature [30-34] is aligned with a center of the yoke body [10, 20] in the center position (figure 3); and

a spring [40-45] fixed with respect to the yoke body [10 ,20] at a clamped position [42, 43] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in a direction of motion (col. 4, lines 30-36).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, or that when the armature part is at the equilibrium position the spring is pre-tensioned to apply a force in the axial direction.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, when the armature part [2, 3] is in the center position, the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to the clamped position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]; at the center position, which is shifted to the left from what is shown in the figures, the point of application [42] and clamped position [41] are still displaced from one another as the figures clearly

show the displacement between yoke and armature being significantly less than the distance “b”), and

wherein, when the armature part is at the center position, the spring is pre-tensioned (figure 3 shows the axially displaced armature in its equilibrium position; at the center position, which is shifted to the left from what is shown in the figures, the springs are inherently pre-tensioned as they are no longer at equilibrium).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

With regard to claim 14, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 13, as stated above, wherein the spring [40-45] is configured as a spring tensioned transverse to the direction of movement of the armature part (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 15, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 14, as stated above, wherein the spring [40-45] comprises a leaf spring (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 16, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 13, as stated above, further comprising a plurality of

springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67 of Zabar; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 17, Zabar discloses the drive unit according to claim 13, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position (figure 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part away from the compressor as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 19, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 13, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

With regard to claim 20, Zabar discloses a linear drive unit [2] (figures 1-3) comprising:

a yoke body [10, 20] having an exciter winding [15, 25] providing a magnetic field (col. 3, lines 12-24);

a magnetic armature part [30-34] which is set in linear oscillating motion about a center position in an axial direction by the magnetic field of the winding (col. 3, lines 36-40), the center position being the position where the center of the armature [30-34] is aligned with the center of the yoke body [10, 20] and/or windings [15, 25] thereof (figure 3; the armature is shown with the springs un-deflected), the center position being an equidistant point between two maximum lateral deflections of the magnetic armature [30-34] when oscillating (figure 3; col. 3, lines 36-40 and 50-59); and

a spring [40-45] having a fixed end [42, 43] clamped in a fixed manner at a clamped position with respect to the yoke body [10 ,20] and an oscillating end [41] coupled to the armature part [30-34] at a point of application and acting on the armature part [30-34] in the direction of motion (col. 4, lines 30-36);

wherein the spring [40-45] is configured to be tensioned to apply a force in an axial direction along movement of the armature part (figures 3 and 5; col. 4, lines 21-29 of Zabar).

Except that Zabar does not expressly disclose that, when the armature part is at the center position, the point of application of the spring on the armature part is displaced axially by a predetermined distance in relation to the clamped position of the

spring, or that when the armature part is at the equilibrium position the spring is pre-tensioned.

Rumswinkel discloses a linear drive unit (col. 1, lines 1-5 and figures 1-3) comprising a yoke body [1] having an exciter winding providing a magnetic field (see col. 1, lines 5-10), a magnetic armature part [2, 3] which is set in linear oscillating motion about a center position in an axial direction (reference [20] designates the direction of movement) by the magnetic field of the winding (col. 1, lines 10-19);

wherein, in the center position of the armature part [2, 3], the point of application [42] of the spring [4] on the armature part [2, 3] being displaced axially by a predetermined distance in relation to its clamping position [41] (figures 2-3; in its equilibrium position, the armature is displaced by distance [b]).

wherein, when the armature part is at the center position, the spring is pre-tensioned to apply a force in an axial direction along movement of the armature part [2, 3] when the armature part [2, 3] is at the center position (figure 3 shows the axially displaced armature in its equilibrium position; at the center position, which is shifted to the left from what is shown in the figures, the springs are inherently pre-tensioned as they are no longer at equilibrium).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part as taught by Rumswinkel, for improving the efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (col. 1, lines 25-32).

With regard to claim 21, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 20, as stated above, wherein the spring [40-45] comprises a leaf spring (figures 3 and 5; col. 4, lines 21-29 of Zabar).

With regard to claim 22, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 20, as stated above, further comprising a plurality of springs [40-45] disposed on each side of the center position (figures 3-4; col. 3, lines 60-67 of Zabar; each spring [40] comprises two leaf springs [44, 45]).

With regard to claim 23, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 20, as stated above, wherein the armature part [30] is connected to a plunger [3] of a compressor [4, 5, 6] (col. 2, line 62 through col. 3, line 3 of Zabar).

Except that Zabar does not expressly disclose that, in the center position of the armature part, the point of application of the spring on the armature part being displaced axially by a predetermined distance in relation to its clamping position, and the axial displacement of the point of application of the spring on the armature part being provided in the direction away from the compressor.

Rumswinkel discloses the drive unit according to claim 7, as stated above, where the armature part is displaced axially in relation to its clamping position.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the linear drive unit of Zabar by offsetting the armature part away from the compressor as taught by Rumswinkel, for improving the

efficiency thereof, since Rumswinkel teaches that such a drive unit minimizes the air gap between the magnetic components (see col. 1, lines 25-32).

With regard to claim 25, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 20, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

With regard to claim 26, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 7, as stated above, wherein the armature part [30-34] includes two magnets [31-34] arranged symmetrically on each side of the yoke body [10, 20] in the center position (figure 3; col. 3, lines 36-40 of Zabar).

5. Claims 11, 18, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zabar and Rumswinkel as applied to claims 7, 13, and 20, respectively, above, and further in view of Howe (US 3,678,308).

With regard to claim 11, the combination of Zabar, Rumswinkel discloses the drive unit according to claim 7, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42;

the driving force frequency, the "square wave”, is twice that of the drive unit, the “scan frequency of the element”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

With regard to claim 18, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 13, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42; the driving force frequency, the "square wave”, is twice that of the drive unit, the “scan frequency of the element”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device

prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

With regard to claim 24, the combination of Zabar and Rumswinkel discloses the drive unit according to claim 20, as stated above, except that the combination does not expressly disclose that the spring [40-45] has a spring constant selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force.

Howe discloses a drive unit (figure 2) having a spring [52] whose spring constant is selected such that the characteristic frequency of the drive unit in cooperation with the total oscillating mass is lower than the frequency of the driving force (col. 1, lines 37-42; the driving force frequency, the "square wave”, is twice that of the drive unit, the “scan frequency of the element”).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the drive unit of Zabar by selecting the spring constant as taught by Howe, for determining the oscillation speed thereof, since Howe teaches that proper coordination of the spring with the natural frequency of the device prevents irregular movement when the device moves too quickly or slowly (col. 1, lines 25-36).

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Andrews whose telephone number is (571)270-

7554. The examiner can normally be reached on Monday through Thursday between the hours of 7:30 and 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quyen Leung can be reached at (571)272-8188. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quyen Leung/
Supervisory Patent Examiner, Art Unit 2834

/M. A./
Examiner, Art Unit 2834